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AUTHOR Harnischfeger, Annegret; Wiley, David E.
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ABSTRACT

The results of an investigation of the evidences, causes, and consequences of the decline of achievement test scores are discussed. First, data from ten different standardized achievement test batteries were reviewed to determine whether or not achievement test scores actually have been declining since the mid sixties. Second, changes in the achievement tests and test takers were examined to determine if they could be judged as causes for the decline. Third, societal and school changes, especially those in curriculum, were examined as possible causes for the decline. Finally, the authors determined that there was no single cause of declining achievement test scores and that the assessment of causes was hampered by complex school and social factors. Suggestions for further action and a bibliography are included. (MV)

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THE DECLINE OF ACHIEVEMENT TEST SCORES: EVIDENCE, CAUSES, AND CONSEQUENCES

Annegret Harnischfeger & David E. Wiley

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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INTRODUCTION

Achievement test scores rose steadily until the mid-sixties and have been declining ever since. The decline has coincided with large increases in educational expenditures (this year totaling $130 billion), and, meanwhile, enrollments have begun to decrease. Is the money being misspent? Are the reported declines artifacts or unimportant? The concern is nationwide. In response to the decline, many districts and schools have abruptly turned "back to basics." But others ignore achievement test scores because they consider them invalid indices of educational attainment. If the decline indicates real deficiencies, what is wrong with American education and what changes are needed?

THE EVIDENCE: TESTS AND SCORES

Tests

Harnischfeger and Wiley (5) reviewed data from ten test batteries involving more than forty tests. Their data base was comprised of scores for pupils in kindergarten through twelfth grade, including college-bound students, and covered all of the commonly tested subject areas. The test batteries reviewed included the Scholastic Aptitude Tests, American College Tests, Iowa Tests of Basic Skills and of Educational Development, Comprehensive Tests of Basic Skills, and National Assessment of Educational Progress.

Achievement Test Scores

Since the mid-sixties, achievement test scores have been declining in all tested subject-matter areas for grades 5 through 12, with the most dramatic drops occurring in recent years and being most evident for higher grades. The declines have been most pronounced in verbal tests, particularly for college-bound females. There is no evidence for declines in lower grades (grades 1 through 4), and perhaps there are increases. Today's first graders enter school with more developed skills, such as knowledge of letter names, numbers, and word meaning, than their counterparts of the mid-sixties.

Our analyses indicate that the findings are not artifacts and that they describe a national phenomenon. And this great generality of the phenomenon draws our concern. The fact that achievements measured in higher grades have declined more than those measured in lower ones reflects differences in the content tested as well as the ages of the test takers. For example, large declines have generally been observed in most tests of verbal and reading-related skills except those given in the lower and middle elementary grades. One reason for this may be that while the lower-level tests primarily measure decoding, word structure, basic vocabulary, and simple comprehension skills (i.e., literacy), the tests used in later grades are oriented toward comprehension and interpretation of more complex textual materials. The only increases in verbal skills scores for the higher grades (eleventh and twelfth grades, National Assessment of Educational Progress, 1971 and 1975) were found in those simpler skills measured by standardized tests in elementary school. One straightforward interpretation would be that scores for the most fundamental reading skills are increasing, but scores for more advanced skills are declining. Moreover, the grade-level discrepancy—large declines in the highest grades, and no declines or even increases in the lowest—holds for other areas, not merely for verbal skills, and these discrepancies also indicate differences in test content.

TM006 384

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Do the declines merely result from changes in the tests or changes in the kinds of pupils who have taken the tests?

Changes in Tests

Although the contents of standardized tests have changed, these changes have been minor, and scores have not been significantly affected by them. Other changes can be made, however, that are *not merely modifications in the content* but have to do with their *scoring* and *scaling*.

One test series that is subjected to a very complex equating method is the Scholastic Aptitude Test (SAT). The scores for each new form of the SAT are empirically equated to those of earlier forms. Investigation indicates that there has been some drift in the equating of this test, but there is no evidence that this drift accounts for the decline. In fact, it has hidden about one-fifth of the verbal and one-fourth of the mathematical declines.

Changes in Test Takers

If there have been no changes in tests that could account for the decline, what about changes in the groups who have taken the tests?

Females: Some observers, for example, have attributed part of the decline in college-bound students' scores to increasing proportions of more poorly prepared females entering college. It is definitely true that the scores of females have declined more rapidly than those of males, especially in verbal areas; however, given the magnitude of the total decline and a sizable male decline, the marginally greater female decline could only account for a small part of the total.

Socioeconomic Status: Has the socioeconomic composition of those who have taken the college entrance tests changed? No, this composition has not changed for the Scholastic Aptitude Test over the last five or six years. As a matter of fact, the family income of this group, adjusted for inflation, actually increased almost nine percent from 1967 to 1973, a period of dramatic test-score decline. Given the strong correlation between achievement and family income, such an increase would normally be expected to affect scores favorably.

Racial Background: The racial composition of the tested groups (SAT) can be considered stable over the past four years. (For example, the percentage of blacks has been a constant eight percent.) Thus, the often advanced explanation that higher percentages of minority students are taking college entrance examinations and are affecting the test scores is unfounded.

Dropouts: The dropout rate decreased sharply from 1950 to 1958 (from 50 percent to 25 percent). Since then it has been stable. This, in fact, does mean a change in the takers of school-based elementary and secondary tests, as more pupils in grades six through twelve who in earlier years would have dropped out and who were typically low achievers, now take these tests. However, this change in composition of test takers is not large enough to explain the relatively large test score declines in the seventies.

Early Graduation: Early graduation has increased nationwide from 2.2 percent (1971/1972) to 7.7 percent (1973/1974). The argument has been raised that most early graduates are high achievers, and, thus, this increase has affected twelfth grade scores. However, the data indicate that early graduates represent most of the spectrum of high school pupils except the lowest ranges of achievement. Therefore, the large achievement test score declines for twelfth graders cannot be explained as the effect of early graduation of the "cream."

To summarize, we have concluded that changes in the tests and the ways they are scored, and changes in the composition of the groups taking the tests, cannot account more than slightly for the declines that have been observed. We will have to look elsewhere if we are to find explanations. The search for causes has to extend to society and school.

Changes in the Society

The effects of societal changes are extremely difficult to trace. We will mention some factors, however, that might have impact on test scores even though we are not in a position to assess their actual influence.

Family: The American family has undergone dramatic changes over the past twenty-five years: Labor force participation of married women with school-aged children has increased from 26 to 51 percent; single-parent families have increased from about 10 to almost 17 percent of all families; and the number of illegitimate children has tripled.

Baby-Boom Generation: There are still other family- and generation-specific factors that might relate to achievement declines. The pupil population of the last decade, now in secondary schools, is the baby-boom generation. This generation not only crowded the schools but also had an unusual family environment. Their parents typically married and had children at a considerably earlier age than parents in the periods before or after. Since income increases with age, those children were, on the average, born into economically poorer environments. A hypothesis we have not yet been able to confirm concerns the likelihood that a higher proportion of children were born, during that time, in lower rather than middle classes. Both historic occurrences might be contributing to the present test-score decline.

Childspacing: Another unique feature of the present pupil generation that is relevant to achievement concerns childspacing. Children were born somewhat closer to each other than children of previous generations. Research indicates that, in general, close spacing seems to have a negative effect on achievement. Explanations for this finding are based on the decreased amount of individual parental attention or interaction that children receive when younger siblings are close in age.

However, since we lack direct evidence of the relation of these societal changes to achievement test score changes, we have to remain very speculative about those potential causes of test score declines located in the society and, more intimately, in the family.

Changes in the Schools

Much of the blame for achievement score declines has been attached to the schools. Have there been changes in the schools that could account for the declines?

Absence: Over the period of decline, student absences have increased. These absences have decreased children's exposure to schooling and may also have made teaching somewhat more difficult, which might account for part of the decline.

Achievement Motivation: Absence rates may indicate motivational changes in pupils, which is another possible explanation for declining test scores. The economic value of schooling has, in fact, declined: The recent recession has made it more difficult to obtain jobs and has decreased the monetary return of additional years of schooling. If pupils or their parents believe that there is no great economic benefit in college or university attendance, then are they less motivated to achieve well in secondary school? Have even more fundamental changes occurred in the values of this generation of pupils? We cannot ignore these possibilities, even though we do not have any solid evidence.

Desegregation and Mobility: Some have suggested that the increases in busing and desegregation result in school turmoil which, in turn, decreases achievement. Others have indicated that the American population has been increasingly mobile and that moving from school to school may lower achievement. Under close scrutiny, however, these two explanations seem unlikely since neither regional or state increases in levels of pupil mobility or desegregation parallel the decreases in achievement. In fact, the smallest declines in test scores seem to have occurred in the southeastern United States, precisely the area with the greatest amount of desegregation.

Teachers: Are teachers less skillful? Some observers have advanced this as a fact, but there is no evidence for changes in teacher characteristics and skills that could clearly account for the decline in achievement. Moreover, although the average levels of teaching experience dropped continually until recently, the average number of years of college training increased.

If these school changes do not seem potent enough to account for the dramatic test score decline, are there any other factors that could account for it?

Exposure to the Curriculum

One characteristic of schooling that has changed dramatically, and could constitute a valid explanation of the decline is the amount of exposure of secondary school pupils to various parts of curriculum over the period of the decline.

Solid data are available for a short but important period of the decline—the early 1970s. These data were collected in National Center for Education Statistics surveys of curricular offerings and course enrollments in American secondary schools. Integrating summary information from two surveys (1970/1971 and 1972/1973), Harnischfeger and Wiley (5) found that a number of important changes had occurred over a short period.

English: For regular, yearly courses in English, for example, "Tenth Grade English," the proportion of pupils enrolled declined by 15 percent. Moreover, other elective and specialty courses that might serve as compensation did not increase nearly enough to offset this decline. All in all, there was an eight percent drop in total proportion of students taking English courses in American secondary schools in the early 1970s.

Foreign Languages: For foreign languages, we find similar declines. French dropped 14 percent, German 13 percent, and Latin 13 percent; Spanish increased, but only by 2.6 percent, and enrollment for other, less common languages decreased in total by 25 percent. To summarize by level, first-year language enrollments decreased by 9 percent, second-year by 7.5 percent, and more advanced enrollments decreased by 3 percent.

History: There has been no total decline in history enrollment, but there has been a substantial rearrangement. Overall, enrollment in traditional history courses declined about 6 percent. More specifically, for the three courses in this category, United States history declined 7 percent, state history 14.5 percent, and world history did not decline at all. This total drop in traditional history courses was offset by a 33 percent increase in elective and specialty course enrollments.

Mathematics: Mathematics enrollments also had a total decline during the early seventies amounting to about 7 percent. But again, the details are important because there was also reorganization in the pattern of courses taken. Enrollments in remedial courses, always proportionately small, remained so absolutely, but in relative terms increased by 80 percent (from 1.4 to 2.6 percent). General mathematics enrollments decreased by 15 percent. College preparatory enrollments did not change overall but, interestingly enough, there was also a redistribution in this area: Enrollments in beginning and intermediate algebra and plane geometry decreased while those in very advanced and specialty courses increased.

Natural Science: There were large declines in science enrollments as well. Total general science enrollment declined in secondary schools by 13 percent and, within the senior high school grades, by even more—30 percent. College preparatory science also declined: biology by 1 percent, chemistry, 10 percent, and physics, 30 percent, the decline magnitude depending on the mathematical preparation required. The only increases were in specialty courses in biological science—ecology, for example, which increased by 61 percent.

To summarize, there has been a general and sizable drop in academic course enrollments. There have been large drops in general or required courses and small increases in elective or specialty courses. There has been a remarkable drop in basic college preparatory courses—first- and second-year foreign languages, algebra and geometry, and chemistry and physics. There has also been an extreme drop (30 percent) for practical courses (homemaking and vocational courses).

Clearly, secondary pupils are taking fewer academic courses, but perhaps there has been a substitution of other activities that do not count as courses but do count for graduation credit. If, for example, work-study programs have increased because of heavy emphasis on career education, this could account for the decreases in academic course enrollments. These activities would not be included, however, as courses in enrollment surveys such as those conducted by the National Center for Education Statistics.

There is no sole and solitary cause of declining achievement test scores, and the assessment of causes is hampered by complex interrelations between societal and school factors. As societal factors seem more distal to the achievement decline, we focus on the school, especially on curricular issues.

We reported lower test scores in diverse areas: English, writing, literature, vocabulary, reading, social studies, mathematics, and natural sciences. These are traditional academic learning areas. What are the typical accomplishments in these areas that are assessed by standardized tests? And where are the deficiencies? Are they losses in knowledge, concept formation, abstraction, analytic skills? Only thoughtful content analyses of tests can answer this important question. We also need to ask whether pupils have gained in areas not assessed with typical standardized tests: Have they improved in effectiveness of public debate and speech? Have they gained in human understanding or understanding in aesthetic areas (art, music)? Have there been relevant curricular changes?

The trend in secondary education towards "special" and more expressive courses indicates that the traditional common academic base may not be readily accepted anymore, either by teachers or by pupils. Maybe parts of traditional course contents are obsolete, and perhaps instead of attempting innovation of traditional curricula, which is a cumbersome and expensive process, the practical education community has been helping itself with new "special" courses, whose contents might be highly distinctive from school to school and not attended to by test developers.

A Search for Patterns

In all likelihood, curricular changes are responsible for part of the test score decline. But we also need to clarify what lower academic course enrollments mean. Other systematic changes, including declines in vocational and music enrollments and increases in artistic ones, make the general pattern difficult to understand. Are these decreases connected with shortened school days, or increased study halls, which substitute for homework? If not, to what extent are these courses replaced—beyond the small increases in special offerings—by aesthetic or expressive activities, or vocational pursuits not categorized as courses, such as work-study programs or part-time jobs?

The reports of achievement declines are presently being used to support or initiate various movements. A considerable number of schools and districts are moving "back to basics," and districts and states are establishing minimal requirements for graduation from elementary and secondary schools.

The back-to-basics movement clearly implies curricular change. Sales of instructional equipment are dropping, while those of textbooks with emphasis on more traditional content are rising. This movement counters one important characteristic of recent curricular trends: the increase in the diversity of offered and accepted experiences, at least in secondary school. This trend has exhibited itself in 1) the increasing local diversity of curricula, 2) the augmented numbers of courses appealing to special groups, and 3) the greater numbers of elective as opposed to "core" courses.

A Question of Test Coverage

It is, of course, much easier to representatively assess the state of intended learnings when the curricula have a large common core of "basics" than when they have little commonality. If we have moved from an era when tests were developed against the background of strong consensus on goals, and consequent great similarity in the curricula widely offered, to an era of disagreement over goals and curricular diversity, but little change in test coverage, then achievement declines on standardized tests would naturally follow. In fact, it is hard to see, under these conditions, how scores could not drop.

Problematically, the back-to-basics proponents seem to neglect the untested content by only focussing on skills that are commonly represented in most tests. Has the movement's reemphasis on educational fundamentals been simplistically based on concern about test score declines, together with other dissatisfactions such as increased societal permissiveness, or has it resultsd from a thorough reconsideration of educational goals and content of the curriculum? For a thoughtful and engaged educator, it is difficult to endorse the movement at this time. What we need and what the achievement score trends should provoke is a reconsideration of educational goals.

We need to carefully valuate losses and possible gains in pupils' knowledge and skills against a thoughtful vision of our future and, particularly, our students' future. The recent test score declines should initiate a reconsideration of basic and advanced skills, skills necessary for a rounded life, consumption, employment, leisure, and political action. The importance of achievement test score declines cannot be meaningfully assessed and thoughtful action cannot be initiated without a thorough consideration of these issues and questions.

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